AMIP-98-OMSC-01

PROJECT TITLE **Standard Object Development**

STANDARDS CATEGORY Object Management

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EXECUTIVE SUMMARY

This proposal is directed at accomplishing two objectives. The first is to develop an initial set of standard objects for use in Army models and simulation. The second is to develop a set of tools and procedures that will provide for the development, control, dissemination, and updating of standard Army objects.

BACKGROUND

Object-oriented programming offers the potential for increased code reuse, maintainability, and ease of developing entity-level simulations. Because of these benefits, the use of object-oriented technologies will increase over time. In order to prevent duplication of effort and the development of incompatible models, objects will need to be managed. To address this issue, the Deputy Undersecretary of the Army for Operations Research (DUSA-OR) directed the development of an Army object management policy. This proposal encompasses the tasks necessary to develop this policy and lays the foundation for the development of Army standard objects.

TECHNICAL APPROACH

Based on the initial guidance to the Object Management Standards Category (OMSC), this project is focused on the development of abstract object class definitions. This effort will develop functional definitions of objects that are robust and reusable by different simulation development applications versus developing specific objects in a specific language for a specific application. The approach selected for this project resembles the model-test-model methodology used by the modeling and simulation community. Specifically, this project will first develop an initial set of objects proposed for M&S community use. The project will then develop a set of object management tools and procedures for object storage and retrieval. Next, an additional set of new objects will be developed using these new tools and procedures expanding the initial set of objects. Based on this process, the object tools and procedures will be refined with the final results to be presented to the Army modeling and simulation community for review. The six major phases and/or components of this project are as follows:

1. Develop Initial Set of Abstract Objects

This phase will start with an initial set of objects developed by TRAC-MTRY. Their effort was designed to identify an initial set of entities, entity attributes, and entity

interactions through the review of key Army combat models. The focus of this phase will be to associate standard data/sources of data with attributes and associate standard algorithms/sources of algorithms with methods. During this process, missing standard data or algorithms will be identified and reported to the appropriate standards category. This first set of objects will be provided to a wide spectrum of the Army modeling and simulation community for review and comment.

2. Develop Abstract Object Taxonomy

An object taxonomy will be developed concurrently with the first phase. The intent of this effort will be to provide a structure that will allow for the categorization of objects. Characteristics in this taxonomy will include:

- granularity or resolution (i.e., aggregate units, individual platforms, system/subsystem, and components)
- domain (i.e., TEMO, ARC, and RDA)
- function (i.e., force development, training, test, engineering, etc.)
- timing (i.e., real time and non real time).

With this taxonomy, it will be possible to identify duplication of effort as well as identify potential voids in the available set of Army objects.

3. Develop Object Documentation Format

This phase will focus on the development of a standard to document objects. Included in this effort will be a determination documentation content, documentation format, object communication protocols, attribute data formats, meta-data requirements. Development of an object documentation format will allow objects developed by different organizations to be shared across the Army/DOD modeling and simulation community.

4. Develop Additional Abstract Objects

After the development of a prototype object documentation format, additional objects in new areas will be developed. These new objects will be used to test and enhance, as required, the object documentation format.

5. Prototype Automated Tools

This phase is directed at proto-typing a set of automated tools to assist in the documentation and use of Army objects. The primary figures of merit for this effort are ease of use and the ability to distribute the tool set to interested organizations.

6. Develop Object Nomination and Control Policy/Procedures

The final phase of this project will develop recommended policies and procedures for object development, distribution, ownership, control, and maintenance.

PRODUCTS

- Initial set of standard objects for combat simulation
- Object management procedures
- Object management tools
- Identification of standard data/algorithm voids for object development
- Object taxonomy with assessment of coverage and voids

MILESTONES

	O	N	D	J	F	M	A	M	J	J	A	S
Develop Initial Set of Objects	←	—	→									
Develop Taxonomy	←	—	—	—	→							
Develop Object Format		←	—	—	→							
Develop New Objects				←	—	—	—	—	→			
Develop Tools					←	—	—	—	—	→		
Develop N/C Procedures									←	—	→	
Document Results												↔

COST/RISK/BENEFIT ANALYSIS

The projected cost for this project is $150,000. The risk to complete this effort is assessed to be low. A number of potential solutions to the problems addressed by this project have been proposed or exists. The major challenge is to select/develop a set of solutions that are tailored to the needs of the Army modeling and simulation community. The ultimate benefits to be derived from the availability of standard Army objects include:

- reduced knowledge engineering development efforts for new models
- enhanced interoperability/interactivity
- reduction in duplication of effort, and
- identification of investment opportunities to address modeling and simulation voids

EXECUTABILITY

The funding requested for this project will be used for in house government labor at AMSAA, TRAC-WSMR, TRAC-FLVN, TRAC-MTRY, and CAA.